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0580/33

October/November 2019

2 hours

Additional Materials: Electronic calculator Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

For π , use either your calculator value or 3.142.

The total of the marks for this paper is 104.

This document consists of **16** printed pages.

- 1 (a) Write $\frac{1}{4}$ as a decimal.

..... [1]

- (b) Write $\frac{36}{124}$ as a fraction in its lowest terms.

..... [1]

- (c) Work out $\frac{5}{8}$ of 128.

..... [1]

- (d) Write down all the factors of 24.

..... [2]

- (e) Find the highest common factor (HCF) of 24 and 108.

..... [2]

- (f) Write down an irrational number between 3 and 9.

..... [1]

- (g) Write down the value of 25^0 .

..... [1]

- (h) \$8400 is invested for 2 years at a rate of 3.5% per year compound interest.

Work out the total amount of interest earned by the end of the 2 years.

\$..... [3]

- (i) **Without using a calculator**, work out $2\frac{1}{3} + \frac{4}{5}$.

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

- 2 (a) Emma records the number of letters in each word in a sentence.

7 1 5 4 2 4 5 3 3 1 2 4

Find

- (i) the median,

..... [2]

- (ii) the mode,

..... [1]

- (iii) the range.

..... [1]

- (b) Jack records the number of letters in 25 words.

Number of letters in a word	Number of words
1	3
2	1
3	5
4	8
5	6
6	2

- (i) Calculate the mean.

..... [3]

- (ii) Priti picks one of Jack's words at random.

Find the probability that this word has 4 or more letters.

..... [2]

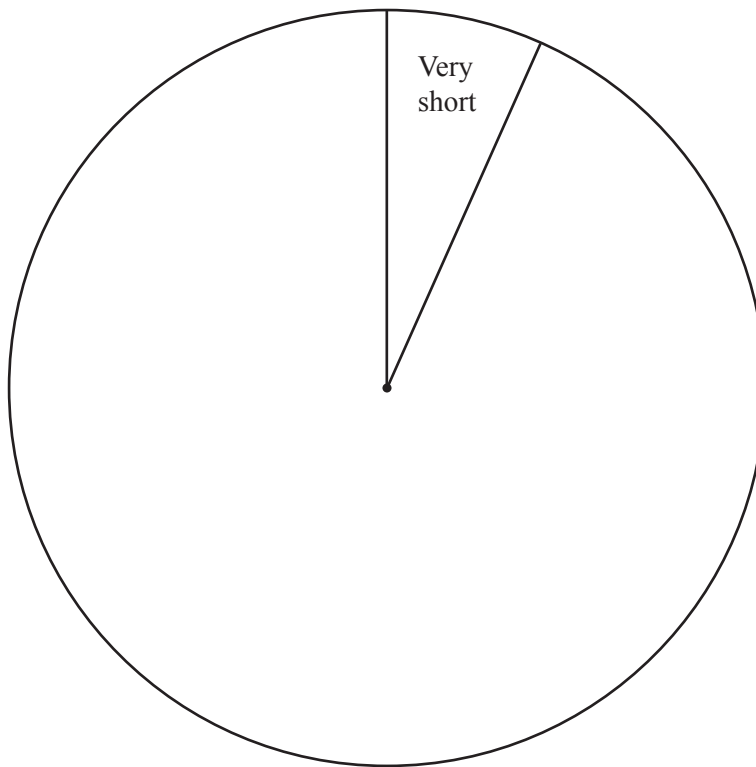
(c) The table shows information about the first 90 words in a book.

(i) Complete the table.

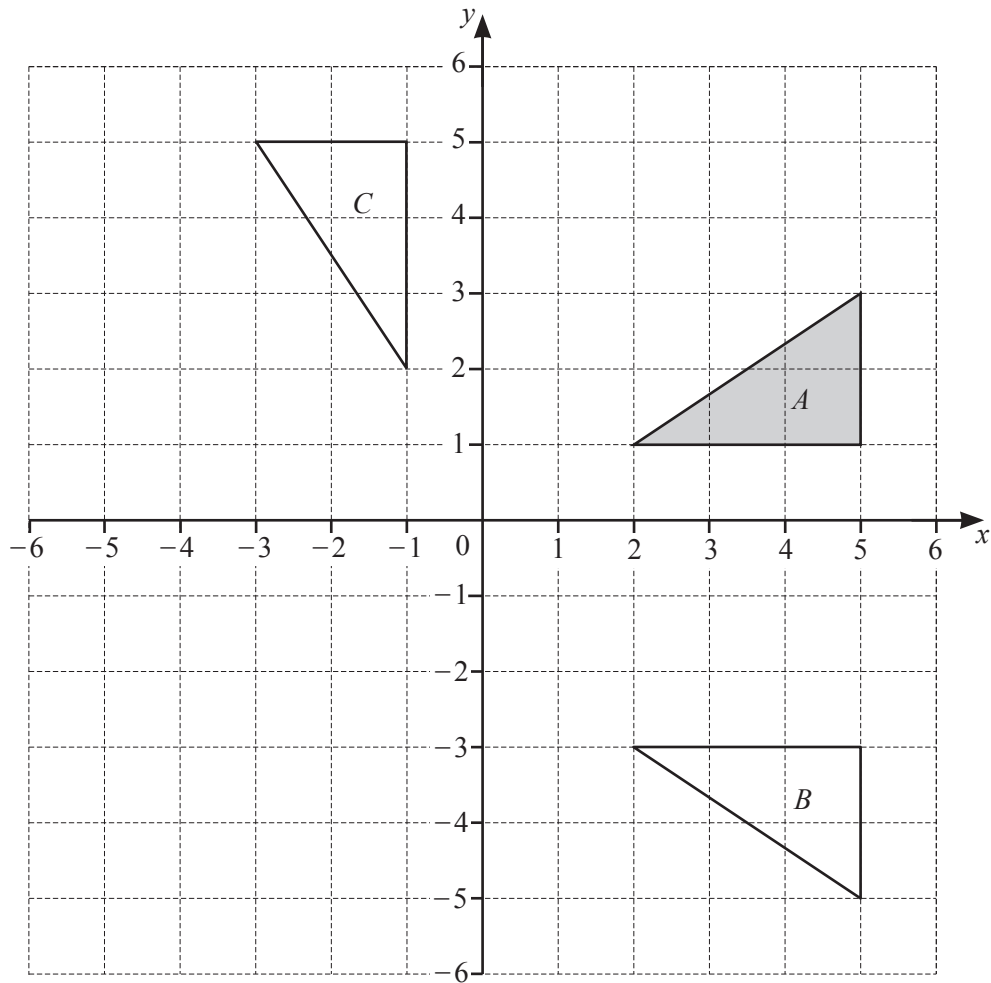
Length of word	Frequency	Pie chart angle
Very short	6	24°
Short	34	
Medium	41	
Long	9	

[2]

(ii) Complete the pie chart to show this information.



[2]



- (a) Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

.....
 [2]

- (b) Describe fully the **single** transformation that maps triangle *A* onto triangle *C*.

.....
 [3]

- (c) On the grid, draw the image of triangle *A* after a translation by the vector $\begin{pmatrix} -2 \\ -3 \end{pmatrix}$. [2]

- (d) On the grid, draw the image of triangle *A* after a rotation of 180° about $(2, 1)$. [2]

- 4 (a) A plane leaves Karachi at 15 30 to fly to Bangkok.
The distance is 3840 km.

The plane flies at an average speed of 720 km/h.
The local time in Bangkok is 2 hours ahead of the local time in Karachi.

Find the local time in Bangkok when the plane arrives.

..... [4]

- (b) In Bangkok a watch costs 2610 baht.
The exchange rate is \$1 = 34.8 baht.

Find the cost of the watch in dollars.

\$..... [2]

- (c) The price of another watch increases from \$18 to \$19.17 .

Find the percentage increase in the price of this watch.

..... % [3]

- (d) Raoul makes a profit when he sells his watch for \$36.
The ratio of the price Raoul paid for the watch and the profit he makes is price paid : profit = 7 : 2.

Work out the profit that Raoul makes.

\$..... [2]

5 (a) Simplify.

$$9x - 2y - 5x - y$$

..... [2]

(b) $P = 4ab + 3b^2$

Work out the value of a when $P = 35$ and $b = 5$.

$a =$ [3]

(c) Solve.

(i) $10x = 5$

$x =$ [1]

(ii) $7x - 3 = 2x + 11$

$x =$ [2]

(iii) $3(2x - 1) = 27$

$x =$ [3]

- (d) Rearrange $T = 5(p + 2)$ to make p the subject.

$$p = \dots\dots\dots [2]$$

- (e) Solve the simultaneous equations.
You must show all your working.

$$3x - y = 22$$

$$x + 2y = 5$$

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots [3]$$

- 6 (a) The scale drawing shows the positions of town A and town B .
The scale is 1 centimetre represents 12 kilometres.



Scale : 1 cm to 12 km

- (i) Measure the bearing of town B from town A .

..... [1]

- (ii) Find the actual distance from town A to town B .

..... km [2]

- (iii) Town C is on a bearing of 064° from town A and 028° from town B .

On the scale drawing, mark the position of town C .

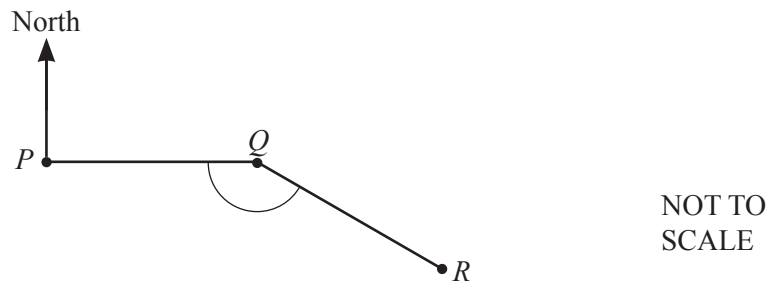
[2]

- (b) The bearing of town D from town E is 245° .

Work out the bearing of town E from town D .

..... [2]

- (c) The diagram shows three towns, P , Q and R .



The bearing of town Q from town P is 090° .

- (i) Complete the statement.

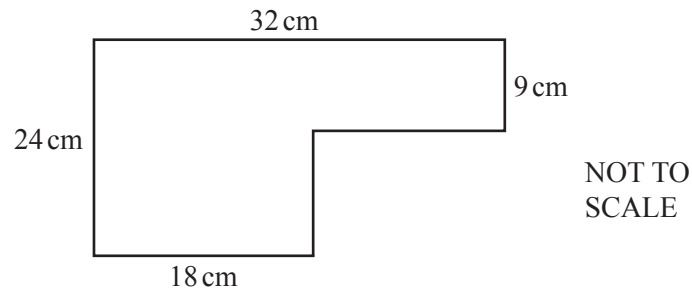
Town is due west of town [1]

- (ii) PQ and QR are two sides of a regular decagon.

Work out angle PQR .

Angle $PQR =$ [3]

- 7 (a) The diagram shows a shape made from two rectangles.



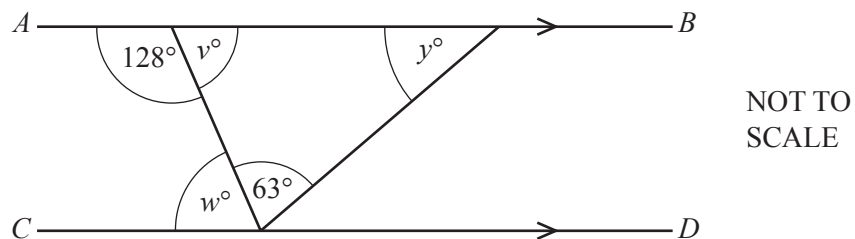
- (i) Work out the perimeter.

..... cm [2]

- (ii) Work out the area.

..... cm² [2]

- (b) The diagram shows a triangle between two parallel lines, AB and CD .



Find the value of

- (i) v ,

$v =$ [1]

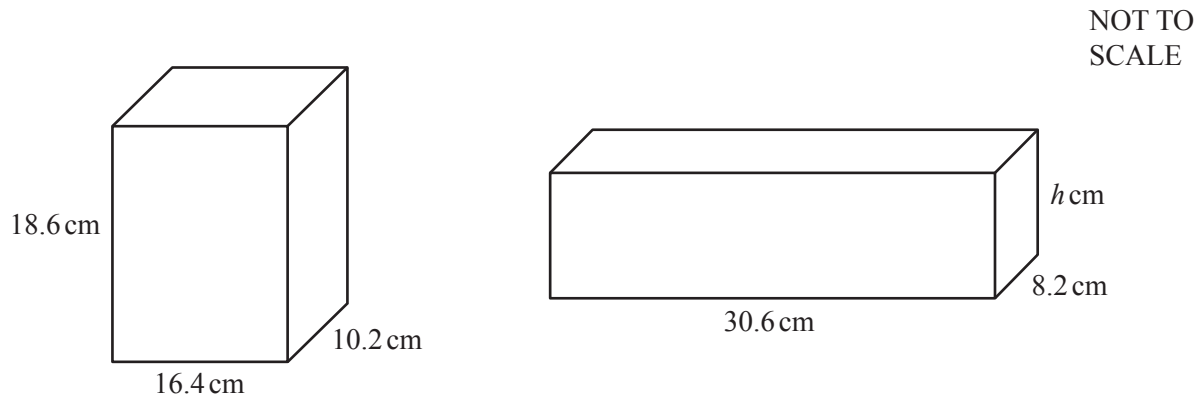
- (ii) w ,

$w =$ [1]

- (iii) y .

$y =$ [1]

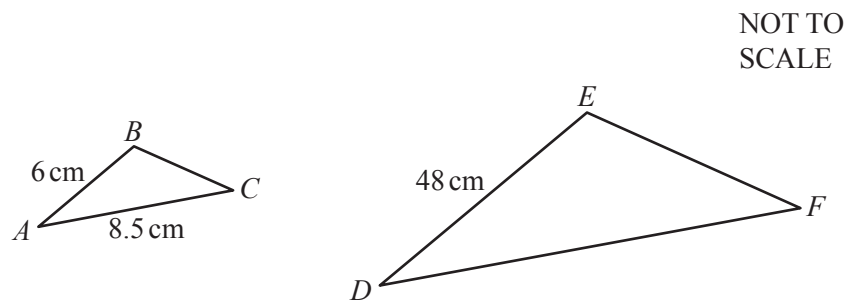
- (c) These two cuboids have the same volume.



Find the value of h .

$$h = \dots\dots\dots [3]$$

- (d) The diagram shows two similar triangles, ABC and DEF .



Calculate DF .

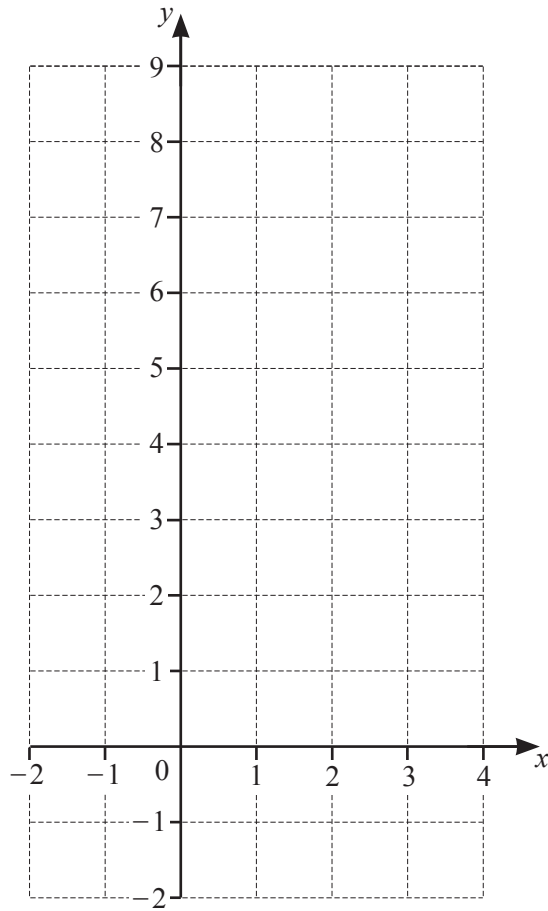
$$DF = \dots\dots\dots \text{ cm } [2]$$

- 8 (a) (i) Complete the table of values for $y = x^2 - 2x$.

x	-2	-1	0	1	2	3	4
y	8		0	-1	0		8

[1]

- (ii) On the grid, draw the graph of $y = x^2 - 2x$ for $-2 \leq x \leq 4$.



[4]

(b) Here are the first four terms of a sequence.

3 9 15 21

(i) Find the next term.

..... [1]

(ii) Write down the rule for continuing this sequence.

..... [1]

(iii) Find the n th term of this sequence.

..... [2]

Question 9 is printed on the next page.

- 9 (a) By rounding each number correct to 1 significant figure, show that an estimate for this calculation is 20.

$$\frac{9.78 + 31.562}{0.381 \times 5.09}$$

[2]

- (b) Write these numbers in order, smallest first.

$$\frac{22}{7} \quad 3.142 \quad \frac{333}{106} \quad 3.1416$$

..... < < < [2]
smallest

- (c) The length, p cm, of a pencil is 9.8 cm, correct to 2 significant figures.

Complete the statement about the value of p .

..... $\leq p <$ [2]

- (d) Calculate $3.142 - \frac{52163}{16604}$.

Give your answer in standard form correct to 2 significant figures.

..... [2]

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